

REMARKS

I. Status of the Claims

Claims 14-26 are currently pending. Without prejudice or disclaimer, Applicants amended claim 14 to recite, in relevant part, "wherein said method is operated in a manner to avoid expansion and cross-linking of said expandable and cross-linkable polymeric material prior to said expanding and cross-linking steps c) and d)." Applicants submit that this amendment makes explicit that which was already inherent to the claim, since the claim already required, for example, the step of "forming a coating layer made of **expandable** and cross-linkable polymeric material" rather than a coating layer of **expanded** and/or crosslinked polymeric material.

Exemplary support for the amendment occurs in the specification as-filed, including the claims. For example, page 4, line 28 to page 6, line 15 of the as-filed specification explain that the prior art taught, *inter alia*, expanding the product during the extrusion process, and that in the invention, expansion and cross-linking downstream with a heated fluid, was intended to avoid the drawbacks of the prior art processes. In the examples, Applicants provide an exemplary method that intentionally operated the process in a manner to avoid any early expansion or cross-linking until heat was applied downstream from the extruder. See specification as-filed, page 15, lines 8-13, 28-32. Therefore, the specification provides written description support for the claim amendments.

II. Interview Summary

Applicants thank Examiner Leong and Examiner Meeks for the telephonic interview with Applicants' representatives on September 15, 2009. During the interview,

the rejections of record were discussed with respect to claim 14. Applicants' representatives presented arguments against the rejections and proposed possible claim amendments. In particular, Applicants' representatives discussed (1) how there was no motivation to utilize prior art cross-linking processes discussed in (but not invented by) Harlin in view of Harlin's disparagement of those processes and (2) how the combination does not teach expansion due to heating after extrusion, since Belli teaches expansion due to extruder and Harlin does not teach an alternative.

III. Rejections under 35 U.S.C. § 103

A. Claims 14-19 and 21-26

Claims 14-19 and 21-26 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over WO 99/33070 to Belli et al. ("Belli") in view of WO 01/38060 to Harlin et al. ("Harlin"). April 27, 2009, Office Action at 2-5 & 6. The Office alleges that Belli teaches a "method of producing an electrical cable comprising a conductor. . . [and] an expanded semiconductor layer. . . that may be made of cross-linked material." *Id.* at 3. Further, the Office asserts that "Harlin teaches the method of cross-linking a layer by curing/heating after extrusion under normal atmospheric pressure (pg. 2, lines 13-16) in the presence of a heating fluid (pg. 3, line 10)." *Id.* The Office further alleges that "Harlin teaches expanding and cross-linking a similar coating layer via a heating fluid at atmospheric pressure after the extrusion process." *Id.* at 6. Applicants respectfully disagree and traverse.

In order to establish a *prima facie* case of obviousness, the Office must objectively perform each of the following factual inquiries:

- (A) Ascertain the scope and contents of the prior art;

- (B) Ascertain the differences between the claimed invention and the prior art; and
- (C) Resolve the level of ordinary skill in the pertinent art.

See *Graham* 383 U.S. 1 at 17-18; see also M.P.E.P. § 2141. Further, prior art must be considered in its entirety, including disclosures that teach away from the claims.

M.P.E.P. § 2141.02 (VI).

Applicants respectfully submit that the Office has incorrectly ascertained the scope and content of the prior art, and thus, the differences between the claimed invention and the prior art, and that the Office fails to consider the teaching away in the cited references.

- A. Harlin and Belli do not teach “expanding . . . downstream of [the] extruder by heating . . . at atmospheric pressure by means of a heating fluid,” per instant claim 14.**

Contrary to the Office’s allegation (April 27, 2009, Office Action at 3, 6), the combination of Belli and Harlin does not teach expanding by heating, let alone “downstream of said extruder by heating...at atmospheric pressure by means of a heating fluid.”

The Office correctly admits that “Belli is silent as to expanding and cross-linking the layer after the extrusion step via a heating fluid at atmospheric pressure.” April 27, 2009, Office Action at 6. Belli states that the “expansion of the polymer is normally carried out during the extrusion phase,” and hence not “after the extrusion step.” Belli, page 12, lines 6-7. Further, because Belli’s extruder, the only source of heat in Belli’s process, usually operates “not lower than 140°C” (Belli, page 13, lines 5-7), the polymer material exiting the extruder has a temperature determined by the extruder temperature and thus begins to *cool as the polymer expands and cross-links* outside the extruder.

Accordingly, Belli does not teach "expanding . . . downstream of [the] extruder *by heating...at atmospheric pressure by means of a heating fluid,*" per claim 14.

Additionally, Harlin does not cure this deficiency in Belli. Harlin does not discuss expansion at all, let alone expansion "downstream of said extruder by heating...at atmospheric pressure by means of a heating fluid." Thus, the combination of Harlin and Belli do not teach expanding by heating, let alone "downstream of said extruder by heating...at atmospheric pressure by means of a heating fluid."

The Office goes on to allege that "[s]ince Belli discloses the same expanding agent as claimed (see below, claim 23), expanding would inherently occurs as the [cross-linking] claim limitations are met." April 17, 2009, Office Action at 3. This argument presupposes without any analysis that the cross-linking process, disclosed but not invented by Harlin, would initiate the expansion process when applied to Belli. That presumption is incorrect. Belli teaches the use of an extruder to achieve the required expansion of the expandable layer. Belli, page 12, lines 6-20. Thus, the expansion process would have been initiated by the extruder well before any cross-linking process introduced from Harlin.

Lastly, the Office states that "it is noted that Belli discusses that the coating should further be expanded after removal from the extruder." April 17, 2009, Office Action at 3. Applicants submit that this is a mis-reading of Belli. Belli merely teaches that the die size may be adjusted so that expansion CONTINUES after the extruder. But more importantly, the expansion is due to the heat provided by the extruder and not by heat applied after the extruder, as required by the claims.

For at least this reason, Applicants respectfully submit the Office has failed to establish a *prima facie* case of obviousness.

- B. Harlin and Belli do not teach a “forming a coating layer made of expandable and cross-linkable polymeric material with the composition thus extruded” and/or “method [] operated in a manner to avoid expansion . . . of said expandable and cross-linkable polymeric material prior to said expanding and cross-linking steps c) and d),” per instant claim 14.**

With the amendments herein, claim 14 recites, in relevant part, “forming a coating layer made of expandable and cross-linkable polymeric material with the composition thus extruded” and “wherein said method is operated in a manner to avoid expansion and cross-linking of said expanding and cross-linkable polymeric material prior to said extrusion and cross-linking steps c) and d).” Applicants respectfully submit that the combination of Harlin and Belli do not teach these related claim elements.

Belli states that the “expansion of the polymer is normally carried out during the extrusion phase.” Belli, page 12, lines 6-7 (emphasis added). By contrast, the method of claim 14 avoids expansion during extrusion and requires the coating of an expandable composition thus extruded. Hence, expansion during extrusion is not covered by the claims.

Additionally, Harlin does not even discuss a method of expansion, let alone a method which avoids expansion during extrusion. Thus, the combination of Belli and Harlin do not teach a method which operated to “[form] a coating layer made of expandable and cross-linkable polymeric material with the composition thus extruded” and “to avoid expansion . . . of [an] expandable and cross-linkable polymeric material prior to said expanding and cross-linking steps c) and d),” as claimed.

For at least this additional reason, Applicants respectfully submit the Office has failed to establish a *prima facie* case of obviousness.

C. Harlin teaches away from “expanding and cross-linking . . . by means of a heating fluid.”

In view of Belli’s deficiencies, the Office now relies not upon Harlin’s invention (i.e., cross-linking by infrared radiation) but rather upon Harlin’s disclosure of the prior art.¹ April 27, 2009, Office Action at 3. Specifically, the Office asserts that “Harlin teaches the method of cross-linking a layer by curing/heating after extrusion under normal atmospheric pressure (pg. 2, lines 13-16) *in the presence of a heating fluid* (pg. 3, line 10).” *Id.* at 3 (emphasis added).

As an initial matter, the Office has not shown the logical basis for combining the two disclosures. While pages 1-4 of Harlin describe a variety of prior art processes, Harlin does not state or suggest that the two cited prior art teachings are related. In particular, the reference to “normal atmospheric pressure” is associated with “[*using*] simple extrusion lines.” Harlin, page 2, line 16. The other reference merely says “crosslinked *after* the extrusion in hot water, steam, or moist air.” Harlin, page 3, line 10.

Nevertheless, as discussed above, the Office does not even allege how Harlin teaches expanding by heating with a heating fluid or how the combination of its process with Belli results in expanding by heating with a heating fluid. Given that Belli teaches a process wherein expansion is due to extrusion, there is no evidence to suggest further expansion due to Harlin’s process.

¹ Applicants had previously overcome the Office’s combination of Belli disclosure with Harlin’s invention. April 27, 2009, Office Action at 6.

More importantly, there is no basis to combine the cited teachings of Harlin and Belli. The cited passage of Harlin (pg. 3, line 10) describes the Sioplas process which involves cross-linking after extrusion using heating fluids. Harlin, page 3, lines 3-10. Yet, the Office conveniently fails to note that the art provides no motivation to introduce this process into Belli. In fact, Harlin expressly teaches these water-based prior art processes have significant disadvantages for cables with extruded coatings. See Harlin, page 1, lines 26-31 (promotes "formation of what are known as water trees in the insulating material"). Harlin notes that "[d]ifferent solutions have been suggested to the degradation of a polymer material owing to the above-described heating of the material." *Id.*, page 4, lines 1-2. Finding disadvantages in those processes, Harlin explains that its process of cross-linking of peroxides with infrared radiation avoids these problems. *Id.*, page 4, lines 11-17 & 28-35.

Because Harlin's disclosure discusses the disadvantages of using a heating fluid for cross-linking and teaches a method to avoid such a procedure, a person skilled in the art would not be motivated to utilize a process of "expanding and cross-linking . . . being carried out . . . by means of a heating fluid." In fact, as stated in M.P.E.P. § 2143, "[w]hen the prior art teaches away from combining certain known elements, discovery of successful means of combining them is more likely to be nonobvious."

Belli does not remedy the lack of motivation to combine, nor does the Office allege that it does. Rather, the Office simply states that "Belli does teach...cross-linking at various other points in the process." April 27, 2004, Office Action at 6. Belli does state that "[t]he expanded polymer material may or may not be crosslinked" and that "[t]he crosslinking can be carried out...by known techniques." Belli, page 13, lines 8-10.

Belli specifically notes that, among other methods, "crosslinking can be carried out via silanes," the same cross-linking technique as Harlin. *Id.*, page 13, lines 13-14; Harlin, abstract. Thus, given Harlin's suggestion that processes using heating fluids are undesirable, if one was to combine Belli and Harlin (which Applicants in no way concede because of differences in between the cited documents), one would still not arrive at instant claim 14 because one would cross-link "by means of infrared radiation," rather than a heating fluid.

Accordingly, because the Office has failed to make a *prima facie* case of obviousness for at the reasons listed above, Applicants respectfully request withdrawal of the rejection.

B. Claim 20

Claim 20 is rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Belli in view of Harlin, as applied to claims 14-19, further in view of U.S. Patent Application Publication No. 2001/0002075 A1 to Chaudhary et al. ("Chadchary"). April 27, 2009, Office Action at 5-6 & 7. The Office relies on the teachings of Belli and Harlan "as applied to the claims above." *Id.* at 5. The Office acknowledges that "Belli in view of Harlin fails to explicitly teach having a maximum decomposition of 50°C between the cross-linking agent and the expanding agent." *Id.* Nonetheless, the Office argues that "Chaudhary teaches the importance of the decomposition temperature in [a] cross-linking process by also maintaining [the] operating temperature based on the decomposition temperature of the cross-link agent." *Id.* The Office then concludes that "[s]ince Belli teaches a coating layer using both an expanding agent and a cross-linking agent together, it would be obvious . . . to know and utilize the decomposition

temperature of the expanding agent taught by Belli and the decomposition temperature of the cross-linking agent taught by Chaudhary so that the cross-linking step and the expansion step could be done together because this would present a more efficient scenario where only one heating step, instead of two, are needed." *Id.* at 5-6.

Applicants respectfully disagree and traverse.

As discussed above, the Office's arguments regarding Belli and Harlan are erroneous. Further, the combination with Chaudhary does not remedy these deficiencies, nor does the Office allege that it does. *See* April 27, 2009, Office Action at 5.

Accordingly, because the Office has failed to make a *prima facie* case of obviousness, Applicants respectfully request withdrawal of the rejection.

CONCLUSION


In view of the foregoing amendments and remarks, Applicants respectfully request reconsideration of this application and the timely allowance of the pending claims.

Please grant any extensions of time required to enter this response and charge any additional required fees to Deposit Account No. 06-0916.

Respectfully submitted,

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